WASHINGTON STATE DEPARTMENT OF ECOLOGY

July 31, 2005
(Updated September 2005)
(Updated January 2006)

CONDITIONAL USE LEVEL DESIGNATION FOR PRETREATMENT (TSS)
PILOT USE LEVEL DESIGNATION FOR OIL TREATMENT
For
Hancor's Storm Water Quality Unit II

Ecology's Decision:

Based on Hancor's application submissions and recommendations by the Technical Review Committee (TRC), Ecology hereby issues the following Use Level Designations for the Hancor's Storm Water Quality Unit II (SWQU-II):

1. **Conditional Use Level Designation (CULD) for pretreatment, as defined in the Ecology Manual Volume I, (a) ahead of infiltration treatment, or (b) to protect and extend the maintenance cycle of a Basic or Enhanced Treatment device (e.g., sand or media filter). This CULD applies to SWQU-II units sized as follows:**

   48" SWQU-II, 20.5 foot length, not to exceed 0.9 cfs
   60" SWQU-II, 20.5 foot length, not to exceed 1.1 cfs

   at the Water Quality design flow rate as determined using the Western Washington Hydrology Model (WWHM).

   These design flow rates equate to approximately 4.8 gallons per minute per square foot (GPM/sf), assuming maximum surface area occurs at 50% pipe-full condition, and surface area equals pipe length times its diameter.

2. **Pilot Use Level Designation (PULD) for oil and grease treatment. This PULD applies to SWQU-II units sized as follows:**

   48" SWQU-II, 20.5 foot length, not to exceed 0.9 cfs
   60" SWQU-II, 20.5 foot length, not to exceed 1.1 cfs

   at the Water Quality design flow rate as determined using the Western Washington Hydrology Model (WWHM).

3. **The pretreatment CULD expires on October 31, 2007, but it may be amended or revoked by Ecology.**

4. **The PULD expires on July 31, 2007 unless extended by Ecology.**

5. **All designations are subject to the conditions specified below.**

6. **Properly designed and operated SWQU-II systems may also have applicability in other situations (example: low-head situations such as bridges or ferry docks), for TSS and oil/grease removal where, on a case-by-case basis, it is found to be infeasible or impracticable to use any other approved practice. Local jurisdictions should follow established variance or exception procedures in approving such applications.**

7. **Ecology finds that the SWQU-II could also provide:**
   - **Water quality benefits in retrofit situations.**
   - **Effective removal of deicing grit/sand in a retrofit application or as a pretreatment step in new or redevelopment situations.**

<u>Ecology's Conditions of Use</u>:

SWQU-II systems shall be designed, installed, and maintained to comply with these conditions:

1. **All SWQU-II systems shall include an external bypass which shall divert flows exceeding 0.9 cfs (48-inch model) or 1.1 cfs (60-inch model) around the facility.**

2. **SWQU-II systems must be designed, assembled, installed, operated, and maintained in accordance with Hancor's applicable manuals and documents and the Ecology Decision and Conditions specified herein.**

3. **Local jurisdictions must file a "Pilot Level Technologies Notice of Intent" form with Ecology prior to authorizing the SWQU-II for a PULD application for oil removal. All facilities installed under a PULD must monitor, at a minimum, oil and grease in accordance with the Ecology-approved QAPP.**

4. **On or before April 1, 2006, Hancor shall submit a QAPP that meets the TAPE requirements for attaining a GULD for pretreatment (TSS)**

5. **On or before April 1, 2006, Hancor shall submit a QAPP that meets the TAPE requirements for attaining a GULD for oil and grease removal.**

6. **Discharges from the SWQU-II system shall not cause or contribute to water quality standards violations in receiving waters.**

7. **Hancor shall complete all required testing and submit a TEER on oil removal for TRC and Ecology review by July 31, 2007.**

8. **Hancor shall complete all required testing and submit a pretreatment TEER for TRC and Ecology review by October 31, 2007.**

9. **Hancor may request Ecology to grant deadline or expiration date extensions, upon showing cause for such extensions.**

Applicant: Skip Short
EPA Phase II Manager
Hancor, Inc.

Applicant Address: 1271 Watson Springs Road
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Application Documents:

- Submittal Documents for Hancor Storm Water Quality Unit (SWQU) Module II, to the TRC (Technical Review Committee), Washington State Department of Ecology (WADOE), dated May 25, 2005.

  With the exception of any confidential files, a CD-ROM containing the submittal documents is available by contacting Hancor.

Applicant's Use Level Requests:

- General Use Level Designation (GULD) for pretreatment.
- Pilot Use Level Designation (PULD) for Oil Treatment.

Applicant's Performance Claims: Based on full-scale laboratory testing using a 60-inch diameter unit, the SWQU Module II achieves 80% TSS removal to a 150 Sieve (100 Microns) at 1.4 cfs (627.2 GPM) or less, and 100% oil removal at 1.0 cfs (448 GPM) or less. This unit is suited for land uses which experience excessive levels of TSS and oil runoff. Such land areas include, but are not limited to: gas stations, fast food restaurants, banks, runoff from roadways, commercial sites, and high-use sites. The Module II is highly suited for such land areas that require a high removal efficiency of TSS and Oil in a relatively small installed footprint.

Technical Review Committee Recommendations: The TRC, based on the weight of the evidence and using its best professional judgment, finds that:

- SWQU-II's should be sized at 1.1 cfs (60-inch model) and 0.9 cfs (48-inch model) based on 80% removal of OK-110 at TSS concentrations ranging from 100 to 200 mg/L.

- Pretreatment guidelines are needed to assess facilities performing at less-than-Basic treatment levels, but adequate to serve as presettling facilities ahead of infiltration treatment. The TRC recommends guidelines be set at 50% removal of 50-micron particles and 80% removal of 125-micron particles. The TRC further recommends these guidelines be applied uniformly to this and all future technology submissions developed and included in Ecology's stormwater manual.
- The SWQU-II system, sized at approximately 4.8 GPM/sf (at maximum surface area, 50% full pipe) should provide, at a minimum, equivalent performance to a presettling basin as defined in the most recent *Stormwater Management Manual for Western Washington, Volume V, Chapter 6.*
- Hancor has submitted laboratory data for its SWQU-II, testing silica material (OK-110 and SCS-106, from U.S. Silica) with median particle sizes of about 100 microns and 20 microns, respectively.
- Hancor has submitted laboratory data for its SWQU-II, testing SAE 10W-40 oil.
- Hancor should be given the opportunity to demonstrate, through additional laboratory and field testing, whether the SWQU-II can attain Ecology's Oil Treatment performance goal.

Findings of Fact:

- Full-scale laboratory tests have been conducted on a 5-ft diameter SWQU-II. OK-110 removal rates averaged 95% for influent values ranging between 100 and 1000 mg/L and flows ranging from 0.5 to 1.0 cfs.
- OK-110 removal rates ranged from 40% to 60% at flow rates between 2.0 and 2.4 cfs.
- SCS-106 removal rates ranged from 10% to 40% across the flow range tested.
- Noticeable sediment resuspension occurred at flow rates above 1.8 cfs.
- Oil removal rates exceeded 95% for an SAE 10W-40 influent oil concentration of 100 mg/L and a flow rate of 1.0 cfs.
- Limited field-derived test data was available from one site for review.
- The system is easily installed, and is readily maintained using a vacuum truck.
- There are approximately 15 SWQU-II systems in use nationwide, none in the Pacific Northwest.

Technology Description:

Design manual and technical bulletins can be downloaded from Hancor's web site.

Recommended Research and Development:

Ecology encourages Hancor to pursue continuous improvements to the SWQU-II. To that end, the following actions are recommended:

- No field-testing data are currently available to reliably ascertain the SWQU-II's ability to remove the finer particles (represented by SCS-106 in laboratory testing) comprising TSS found on local highways, parking lots, and other high-use areas. Likewise, the facility's ambient oil removal performance is also unproven. Design of future facilities should consider:

a. Sizing for specific applications based on actual particle size distribution in the target runoff. Ecology's TAPE can be used as guidance on the expected particle size distributions for Basic Treatment.
b. Testing the system in conjunction with a filter as part of a treatment train.
c. Laboratory and field testing at much lower design flow rates to evaluate whether the SWQU-II could achieve Basic Treatment criteria.
d. Field testing at TSS concentrations ranging from 100-200 mg/L.

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